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Title of the Invention

Multimedia Communication and Presentation

Background of the Invention

1. Field of the Invention

This invention relates to multimedia communication and presentation.

2. Related Art

In computer systems for communicating and presenting data, it is desirable to communicate and present data in a multiplicity of media. Such communication is

1 sometimes called “multimedia communication.” For example, these media can include
2 text, sound, pictures, animation, and combinations thereof. One advantage of multimedia
3 communication is that it can more vividly communicate messages to recipients.
4

5 One problem in the known art is that multimedia elements comprise signifi-
6 cant amounts of data, and are therefore difficult to construct from “scratch” (that is, from
7 basic elements) and difficult to enter into a computer system. This problem is acute for
8 pictures and similar graphical elements, which must generally be “captured” using video
9 equipment. For example, it would be desirable for users to be able to enter picture data
10 into messages for sending, such as when using electronic chat or electronic mail systems.
11 However, known electronic chat systems do not provide this capability, and known elec-
12 tronic mail systems provide only techniques by which pictures that have already been cap-
13 tured using other equipment can be attached to electronic mail messages and transmitted.
14

15 Accordingly, it would be advantageous to provide a system in which multi-
16 media elements can easily be entered and modified, especially in real time. This advan-
17 tage is achieved in a system in which multimedia elements are associated with keystroke
18 or mouse abbreviations so as to be easily entered from a keyboard or mouse, and in which
19 properties of both individual multimedia elements and an ensemble of multimedia ele-
20 ments can be edited to alter the presentation of those multimedia elements.
21

22 Summary of the Invention

1
2 The invention provides a system for entry and modification of multimedia
3 elements for communication and presentation. Abbreviations, each comprising a se-
4 quence of one or more keystrokes or mouse actions (such as the typed word “flower”) are
5 associated with individual multimedia elements (such as a picture of a flower), so that a
6 human operator can enter those multimedia elements using a keyboard or mouse. Each
7 multimedia element has properties (such as size, complexity, or detail), which can be
8 modified once the multimedia element has been entered (such as altering the flower from
9 a relatively smaller picture to a relatively larger picture). The set of individual multime-
10 dia elements is collected into an ensemble, which can itself have properties that can be
11 modified. One such property of the ensemble is a “theme,” which applies to a plurality of
12 multimedia elements in the ensemble and presents a variant of each multimedia element
13 consistent with the theme (such as representing the flower as a cactus in a “Western”
14 theme, or as a rose in a “Romantic” theme).

15
16 In a preferred embodiment, the multimedia editor is included with a com-
17 munication system for sending and receiving electronic chat and electronic mail messages
18 in real time, and for presenting web documents in a compressed form. Each multimedia
19 element can include text, sound, pictures, animation, program fragments (such as a Java
20 applet, a pointer to a database retrieval engine, or a URL), or a combination or compila-
21 tion thereof. When a sender enters an abbreviation, an associated multimedia element is
22 transmitted as an electronic chat message or constructed for transmission as an electronic

mail message; the choice of associated multimedia element can be responsive to a receiver's capability, and can be selected at the receiver dynamically in response to user actions (such as time taken to look at the multimedia element). The sender can also transmit a theme; multimedia objects are presented to the recipient using the sender's theme, or can be overridden to use a different theme. If the multimedia objects associated with the abbreviations are available at the recipient or at a common server, electronic chat messages, electronic mail messages, and web documents can be compressed and transmitted using only the abbreviations.

Brief Description of the Drawings

Figure 1 shows a block diagram of a system for multimedia communication and presentation.

Figure 2 shows a flow diagram of a method for multimedia communication and presentation.

Detailed Description of the Preferred Embodiment

In the following description, a preferred embodiment of the invention is described with regard to preferred process steps and data structures. Those skilled in the art would recognize after perusal of this application that embodiments of the invention can

be implemented using general purpose processors or special purpose processors adapted to particular process steps and data structures described herein, and that implementation of the process steps and data structures described herein would not require undue experimentation or further invention.

System Elements

Figure 1 shows a block diagram of a system for multimedia communication and presentation.

A system 100 includes a plurality of client stations 110, each capable of executing client software 111 such as an electronic chat client or an electronic mail client, and a server station 120, capable of executing server software 121 such as an electronic chat server or an electronic mail server. The client stations 110 and the server station 120 are coupled using a communication network 130.

In a preferred embodiment, the client stations 110 and the server station 120 communicate using a known communication protocol, such as POP or SMTP (simple mail transfer protocol). The client stations 110 and the server station 120 use the known communication protocol for transmitting electronic mail messages, HTTP (hypertext transfer protocol) for transmitting web documents, and other known communication protocols for transmitting electronic chat messages.

As used herein, the terms “client” and “server” refer to a relationship between the client station and the server station, not necessarily to particular physical devices. As used herein, one “client station” or one “server station” can comprise any of the following: (a) a single physical device capable of executing software which bears a client or server relationship to another station; (b) a portion of a physical device, such as a software process or set of software processes capable of executing on one hardware device, which portion of the physical device bears a client or server relationship to another station; or (c) a plurality of physical devices, or portions thereof, capable of cooperating to form a logical entity which bears a client or server relationship to another station. The phrases “client station” and “server station” refer to such logical entities and not necessarily to particular individual physical devices.

Each client station 110 includes a processor, program and data memory, and mass storage (such as a magnetic or optical disk drive). Each client station 110 includes a set of input peripherals 112, including a character input element (such as a keyboard) and a graphic input element (a pointing device such as a mouse, pen, or trackball), and a set of output peripherals 113, including a visual display element (such as a monitor or printer) and an audio presentation element (such as a set of speakers).

Abbreviations for Multimedia Elements

1 The mass storage includes a database 114, including a set of abbreviations
2 115, a set of multimedia objects 116, and a set of associations 117 therebetween.

3
4 Each abbreviation 115 includes a selected sequence of keystrokes (such as
5 typed characters) and/or mouse actions (such as left-button clicks, right-button clicks, and
6 double-clicks). In a preferred embodiment, the abbreviations 115 comprise mnemonic
7 names, such as typed words like “flower” to represent a picture of a flower, “foghorn” to
8 represent a sound clip of a foghorn, and the like, but an operator at the client station 110
9 can also define new abbreviations 115, such as the name of a favorite dog to represent a
10 picture of that dog, even though that name can comprise an arbitrary sequence of charac-
11 ters.

12
13 Each multimedia object 116 includes a data element for use with multime-
14 dia presentation, such as a text element, an audio element (such as a sound clip in AU or
15 WAV form), a graphical element, a picture element (such as a picture in GIF or JPEG
16 form), or an animation or video element (such as a movie clip in AVI or MPEG form).
17 The multimedia objects 116 can also include data elements such as databases, program
18 fragments (such as Java applets or ActiveX hooks, CGI scripts, or a qualified URL), or
19 special document formats (such as a document in Adobe PDF format).

1 Each association 117 includes a link between an abbreviation 115 and at
2 least one multimedia object 116, so that the client station 110 can detect the abbreviation
3 115 and locate the multimedia object 116 in response thereto.

4
5 When an operator of the client station 110 enters sequences of keystrokes
6 and/or mouse actions, the client station 110 examines the database 114 and determines
7 when one of the abbreviations 115 is entered. When the client station 110 detects a par-
8 ticular abbreviation 115, the client station 110 notes the particular association 117 cou-
9 pled to that particular abbreviation 115, and determines the (at least one) particular mul-
10 timedia object 116 associated with that particular abbreviation 115. The client station 110
11 thereby replaces that particular abbreviation 115 with its associated multimedia object
12 116.

13
14 In the case that there is more than one multimedia object 116 associated
15 with that particular abbreviation 115, the client station 110 can select one of those associ-
16 ated multimedia objects 116 in one of several ways:

17
18 o The client station 110 can select one of those associated multimedia objects 116 at
19 random.

20
21 o The client station 110 can select one of those associated multimedia objects 116 on
22 a round-robin basis.

1
2 o The client station 110 can present two or more of those associated multimedia ob-
3 jects 116 to the operator and ask the operator to select one.
4

5 After replacing the abbreviation 115 with its associated multimedia object
6 116 in the sequence, the client station 110 transmits an altered multimedia sequence (that
7 is, with the replacement having been made) to the server station 120, such as for trans-
8 mission to a destination client station 110 as an electronic chat message or an electronic
9 mail message. The server station 120 transmits the multimedia sequence to the destina-
10 tion client station 110 using an electronic chat protocol or an electronic mail protocol.
11 The destination client station 110 receives the multimedia sequence and presents the mul-
12 timedia elements to an operator at the destination client station 110.
13

14 In a preferred embodiment, the client station 110 can replace a particular
15 abbreviation 115 with a multimedia object 116 comprising a particular program fragment
16 in one of at least two ways:
17

18 o The client station 110 can insert that program fragment into the multimedia se-
19 quence, so that the destination client station 110 receives the program fragment for
20 execution.
21

1 o The client station 110 can execute that program fragment directly, so that the des-
2 tination client station 110 receives the multimedia sequence after operation there-
3 upon by the particular program fragment.

4
5 In a preferred embodiment, the multimedia objects 116 can be created using
6 multimedia capture and editing software, such as for scanning pictures and editing those
7 pictures, recording sound clips and editing those sound clips, or for creating and/or edit-
8 ing animation sequences.

9
10 In a preferred embodiment, the multimedia objects 116 can be located at the
11 client station 110, at the server station 120, or at another device coupled to the network
12 130 and accessible by either the client station 110 or the server station 120. If located
13 remotely from the client station 110, the multimedia objects 116 can be cached at the cli-
14 ent station 110, in the database 114 or otherwise, for use as described herein.

15
16 The abbreviations 115 and the associations 117 can be created using a text
17 editor (or similar software for entering and editing information comprising keystrokes),
18 designating the particular sequences of keystrokes and/or mouse actions which comprise
19 the abbreviations 115 and names of those multimedia objects 116 pointed to by their as-
20 sociations 117.

1 The abbreviations 115 and the associations 117 can also be located at the
2 client station 110, at the server station 120, or at another device coupled to the network
3 130 and accessible by either the client station 110 or the server station 120. If located
4 remotely from the client station 110, the multimedia objects 116 can be cached at the cli-
5 ent station 110, in the database 114 or otherwise, for use as described herein.

6 7 *Hierarchy of Multimedia Objects*

8
9 In a preferred embodiment, at least some abbreviations 115 are associated
10 with a plurality of multimedia objects 116 arranged in a sequence or hierarchy. The hier-
11 archy of multimedia objects 116 includes a set of variants of a core multimedia object 116
12 (not necessarily a particular single multimedia object 116), differing with regard to a set
13 of parameters such as size, complexity, or detail.

14
15 For example, the typed word “flower” can comprise an abbreviation 115
16 and can be associated with a hierarchy of multimedia objects 116 representing flowers,
17 including a stylized graphic of a flower, a relatively small photographic picture of a
18 flower, a relatively large photographic picture of a flower, an animation of a flower, and
19 an applet for emulating a flower (including being responsive to local weather reports).

20 When the operator enters the abbreviation 115, the client station 110 can
21 offer the operator an opportunity to select among the hierarchy of multimedia objects 116
22 representing flowers. The client station 110 can also offer the operator an opportunity to

1 alter the selection, either using a separate set of editing commands for the multimedia ob-
2 ject 116, or using one or more abbreviations 115 associated with one or more of those ed-
3 iting commands.

4
5 For example, when the operator enters a particular multimedia object 116
6 using the typed word “flower”, the client station 110 retains information about the proper-
7 ties of that multimedia object 116, including properties in the hierarchy of those multime-
8 dia objects 116 associated with that particular abbreviation 115. The client station 110
9 can alter the particular multimedia object 116 so as to select a different one of those mul-
10 timedia objects 116 associated with that particular abbreviation 115.

11
12 Similarly, the client station 110 can replace the abbreviation 115 with the
13 entire hierarchy of those multimedia objects 116, including a description of its set of
14 properties, so that the entire hierarchy of those multimedia objects 116 is transmitted to
15 the destination client station 110. The destination client station 110 can select one of
16 those multimedia objects 116 associated with that particular abbreviation 115 for presen-
17 tation, and can allow the operator of the destination client station 110 to alter the particu-
18 lar multimedia object 116 so as to select a different one of those multimedia objects 116
19 associated with that particular abbreviation 115.

20 In a preferred embodiment, the destination client station 110 can select one
21 of those multimedia objects 116 associated with that particular abbreviation 115 in the
22 following ways:

- 1
- 2 o The destination client station 110 can ask the operator of the destination client sta-
- 3 tion 110 to choose one of those multimedia objects 116.
- 4
- 5 o The destination client station 110 can select one of those multimedia objects 116
- 6 responsive to capabilities of the client station 110.
- 7
- 8 o The destination client station 110 can select one of those multimedia objects 116
- 9 responsive to preferences known for the operator.
- 10
- 11 o The destination client station 110 can select one of those multimedia objects 116
- 12 responsive to actions by the operator, such as an amount of time the operator uses
- 13 viewing that multimedia object 116. For example, the destination client station
- 14 110 can alter the selected multimedia object 116 to present more detail when the
- 15 operator uses more time viewing that multimedia object 116.

17 *Ensemble of Multimedia Objects*

18

19 In any particular object, the set of individual multimedia objects 116 used

20 therein is collected into an ensemble, which can itself have properties that can be modi-

21 fied. One such property of the ensemble is a “theme,” which applies to a plurality of mul-

1 multimedia elements in the ensemble and presents a variant of each multimedia element con-
2 sistent with the theme.

3
4 For example, in an ensemble of multimedia objects 116, those multimedia
5 objects 116 representing flowers could each be represented as a picture of a cactus when
6 the theme is a "Western" theme, or could each be represented as a picture of a rose when
7 the theme is a "Romantic" theme. Similarly, in that same ensemble, those multimedia ob-
8 jects 116 representing hats could each be represented as a picture of a cowboy hat when
9 the theme is a "Western" theme, or could each be represented as a picture of a helmet
10 when the theme is a "Military" theme. Example themes could include an "Ancient"
11 theme, a "Gothic" theme, a "Military" theme, a "Modern" theme, an "MTV" theme, a
12 "Romantic" theme, a "Western" theme, or other themes known in art or literature.

13
14 Altering the theme for an ensemble would thus alter the presentation of
15 each multimedia object 116 that is linked to the theme for that ensemble. The theme can
16 also be associated with multimedia objects 116 that are not specifically entered using ab-
17 breviations 115, such as a background multimedia object 116 for the ensemble.

18 When the operator enters a particular data object that might include one or
19 more multimedia objects 116, the client station 110 can offer the operator an opportunity
20 to select a theme for that object. The client station 110 can also offer the operator an op-
21 portunity to alter the selection, either using a separate set of editing commands for the

1 multimedia object 116, or using one or more abbreviations 115 associated with one or
2 more of those editing commands.

3
4 When the operator enters a particular abbreviation 115, the client station
5 110 can select among the hierarchy of multimedia objects 116 to find one associated with
6 the theme for the ensemble. The client station 110 can also offer the operator an opportu-
7 nity to alter the selection so as to make that multimedia object 116 either more or less
8 consistent with the theme, either using a separate set of editing commands for the multi-
9 media object 116, or using one or more abbreviations 115 associated with one or more of
10 those editing commands.

11
12 For example, when the operator enters a particular data object, such as an
13 electronic chat message or an electronic mail message, the client station 110 retains in-
14 formation about the properties of that data object, including its theme. For each multime-
15 dia object 116 in the data object, the client station 110 retains information about whether
16 that multimedia object 116 uses the global theme for the data object, or has a specific dif-
17 ferent theme.

18
19 Similarly, if the client station 110 can replace the abbreviation 115 with the
20 entire hierarchy of those multimedia objects 116, the client station 110 can indicate which
21 theme the abbreviation 115 is to be represented with. The destination client station 110
22 can select one theme for those multimedia objects 116 associated with that particular ab-

1 breviation 115 for presentation, and can allow the operator of the destination client station
2 110 to alter the theme, and so alter the presentation of that particular multimedia object
3 116.

4
5 In a preferred embodiment, the destination client station 110 can select the
6 theme for each multimedia object 116 in the following ways:

- 7
- 8 o The destination client station 110 can use the theme indicated by the sending client
9 station 110.
 - 11 o The destination client station can ask the operator of the destination client station
12 110 to choose a theme.
 - 14 o The destination client station 110 can select a theme responsive to known prefer-
15 ences of the operator of the destination client station 110.

16

17 *Compression of Multimedia Objects*

18

19 In an aspect of the invention, when the abbreviations 115, multimedia ob-
20 jects 116, and associations 117 are available both to the sending client station 110 and to
21 the destination client station 110, data objects including multimedia objects 116 can be

1 compressed when transmitting those data objects from the sending client station 110 to
2 the destination client station 110.

3
4 In this aspect of the invention, the sending client station 110 examines a
5 data object in a message (such as an electronic mail message or a web document) to be
6 transmitted from the sending client station 110 to the destination client station 110. When
7 the data object includes a particular multimedia object 116 for which there is an associa-
8 tion 117 with a particular abbreviation 115, the sending client station 110 replaces that
9 multimedia object 116 in the data object with its associated abbreviation 115. The data
10 object is thereby compressed into a more compact form.

11
12 The sending client station 110 transmits the message, including the com-
13 pressed data object, to the server station 120, which transmits the message, including the
14 compressed data object, to the receiving client station 110. The receiving client station
15 110 examines the compressed data object in the message, replaces each abbreviation 115
16 with its associated multimedia object 116, and presents the message, including the origi-
17 nal data object, to an operator.

18
19 In alternative embodiments, the multimedia objects 116 can be available at
20 a remote device coupled to the network 130, and the receiving client station 110 can
21 cache those multimedia objects 116 or obtain them as needed.

1 In alternative embodiments, the abbreviations 115 and the associations 117
2 can be transmitted with the message and the compressed data object.

3 4 *Behavior Associated with Abbreviations*

5
6 Each multimedia object 116 can include a program fragment, such as a Java
7 applet, a CGI script for accessing a local database, or a URL for accessing a remote data
8 object. More generally, each abbreviation 115 can be associated with a sequence of be-
9 havior, such as performed by executing a Java applet as the associated multimedia object
10 116.

11
12 For example, an abbreviation such as the typed word “sales” could be asso-
13 ciated with a multimedia object 116 including a Java applet or CGI script for accessing a
14 local database, retrieving a value for total sales, and inserting that value into the data ob-
15 ject in which the abbreviation 115 is found.

16
17 In a preferred embodiment, a library includes such abbreviations 115, mul-
18 timedia objects 116 including program fragments, and associations 117; and that library is
19 available at the client station 110 or at a remote device coupled to the network 130.

20 21 *Method of Operation*

1 Figure 2 shows a flow diagram of a method for multimedia communication
2 and presentation.

3
4 A method 200 includes a set of flow points to be noted, and steps to be exe-
5 cuted, cooperatively by the system 100, including the sending client station 110, the
6 server station 120, and the destination client station 110.

7
8 At a flow point 210, an operator at a particular client station 110 is ready to
9 enter a data object intended to include multimedia objects 116 for communication or
10 presentation. The data object can comprise an electronic chat message, an electronic mail
11 message, a file object, a web document, or another type of data object known in the dispa-
12 rate arts of computer science.

13
14 For example, the data object can comprise an electronic chat message being
15 composed at a keyboard in real time.

16
17 At a step 221, the operator at the client station 110 enters a sequence of
18 keystrokes and mouse actions, such as using a text editor or similar application program
19 for entry of text objects.

20
21 For example, the operator at the client station 110 can type a sequence of
22 printable text characters.

1
2 At a step 222, the client station 110 examines the sequence of keystrokes
3 and mouse actions, and examines its database 114, so as to detect and locate any abbreviations 115 in the entered sequence of keystrokes and mouse actions.
4

5
6 For example, a particular abbreviation 115 can comprise the typed word
7 “flower”.
8

9 If the client station 110 detects any abbreviations 115, it continues with the
10 next step. Otherwise, it continues with the flow point 230.
11

12 At a step 223, the client station 110 examines the properties of any associated ensemble of multimedia objects 116, and determines whether any such properties affect presentation of any multimedia objects 116 associated with the detected abbreviations 115. In particular, the client station 110 determines if there is a theme associated with
16 any such ensemble, and further determines if any such theme affects presentation of any
17 multimedia objects 116 associated with the detected abbreviations 115.
18

19 For example, if the data object has an associated theme and the theme is a
20 “Western” theme or a “Romantic” theme, the client station 110 determines that the theme
21 would affect presentation of a multimedia object 116 associated with the abbreviation 115
22 the typed word “flower” (such as to select a picture of a cactus or a rose, respectively).

1
2 At a step 224, the client station 110 examines the associations 117 in the
3 database 114, and replaces the detected abbreviations 115 with associated multimedia ob-
4 jects 116.

5
6 For example, the client station 110 could replace the typed word “flower”
7 with a picture representing a flower.

8
9 At a step 225, the client station 110 determines if the associated multimedia
10 objects 116 have properties to be determined which affect presentation or which select
11 among multiple associated multimedia objects 116 in a hierarchy.

12
13 For example, the picture representing a flower can have a property “detail”
14 which distinguishes among a stylized graphic of a flower, a relatively small photographic
15 picture of a flower, a relatively large photographic picture of a flower, an animation of a
16 flower, and an applet for emulating a flower.

17
18 If the client station 110 detects any properties to be determined, it continues
19 with the next step. Otherwise, it continues with the flow point 230.

1 At a step 226, the client station 110 selects values for the properties of the
2 multimedia objects 116. In a preferred embodiment, these values can be overridden by an
3 operator at the client station 110 or at the destination client station 110.

4
5 Similar to the steps 222 through 226, the sending client station 110 can de-
6 tect multimedia objects 116 with associated abbreviations 115 and replace those multime-
7 dia objects 116 with their associated abbreviations 115 (and associated properties), so as
8 to compress the data object.

9
10 At a flow point 230, the data object is ready for transmission from the send-
11 ing client station 110 to one or more destination client stations 110.

12
13 At a step 241, the sending client station 110 transmits the data object to the
14 server station 120 using the network 130 and a known transmission protocol.

15
16 For example, the server station 120 can comprise an electronic chat server
17 and the known transmission protocol can comprise an electronic chat transmission proto-
18 col. Similarly, the server station 120 can comprise an electronic mail server and the
19 known transmission protocol can comprise an electronic mail transmission protocol.

20
21 At a step 242, the server station 120 transmits the data object to the destina-
22 tion client station 110 using the network 130 and the known transmission protocol.

1
2 In alternative embodiments, the server station 120 may perform steps simi-
3 lar to the steps 222 through 226, so as to replace abbreviations 115 known to the server
4 station 120 with associated multimedia objects 116, or to replace multimedia objects 116
5 known to the server station 120 with associated abbreviations 115 (and associated proper-
6 ties).

7
8 In alternative embodiments, the sending client station 110 may transmit the
9 data object directly to the destination client station 110 using the network 130 and the
10 known transmission protocol.

11
12 At a step 243, the destination client station 110 receives the data object and
13 its included multimedia objects 116.

14
15 At a step 244, similar to the step 225, the destination client station 110 de-
16 termines if the associated multimedia objects 116 have properties to be determined which
17 affect presentation or which select among multiple associated multimedia objects 116 in a
18 hierarchy.

19
20 If the destination client station 110 detects any properties to be determined,
21 it continues with the next step. Otherwise, it continues with the step 246.

1 At a step 245, similar to the step 226, the destination client station 110 de-
2 termines if it should override values for the properties of the multimedia objects 116, such
3 as if directed to by an operator at the destination client station 110.

4
5 At a step 246, similar to the step 223, the destination client station 110 ex-
6 amines the properties of any associated ensemble of multimedia objects 116, determines
7 if there is a theme associated with any such ensemble, and further determines if it should
8 override that theme, such as if directed to by an operator at the destination client station
9 110.

10
11 At a step 247, the destination client station 110 presents the data object and
12 its included multimedia objects 116.

13
14 At a flow point 250, the data object has been received and presented to an
15 operator at one or more destination client stations 110.

16
17 *Alternative Embodiments*

18
19 Although preferred embodiments are disclosed herein, many variations are
20 possible which remain within the concept, scope, and spirit of the invention, and these
21 variations would become clear to those skilled in the art after perusal of this application.